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and wherein said chimera is bound to the T4 surface lattice protein array.

63. (Amended) The ~~composition~~ of claim 57, wherein the dispensable polypeptide is derived from a member of the T4 virus family ~~[that encodes a dispensable polypeptide]~~.

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REMARKS

Claims 57-67 are pending in this application. Claims 57 and 63 are amended herein for clarity and to more particularly define the invention. Support for these amendments can be found in claims 57 and 63 as originally filed and throughout the specification. It is believed that no new matter has been added by these amendments. In light of these amendments and the following remarks, applicants respectfully request reconsideration of this application and allowance of the pending claims to issue. Applicants acknowledge that the drawings in this application are objected to by the Draftsperson under 37 C.F.R. § 1.84. Therefore, applicants will provide formal drawings upon allowance of the application.

I. Oath/Declaration

The Office Action states that a new oath or declaration is required because non-initialed and/or non-dated alterations have allegedly been made to the oath or declaration. Furthermore, the Office Action states that applicant has not given a post office address anywhere in the application papers as required by 37 C. F.R. § 1.33(a), which was in effect at the time of filing of the oath or declaration and the specification to which the oath or declaration is directed has allegedly not been adequately identified.

Applicants will provide a new oath or declaration in compliance with 37 C.F.R. 167(a) identifying this application by application number and filing date. Applicants believe this new

Declaration will overcome the objection raised by the Examiner and respectfully request its withdrawal.

II. Sequence Listing

The Office Action states that this application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. § 1.821(a)(1) and (a)(2). However, this application allegedly fails to comply with the requirements of 37 C.F.R. 1.821 through 1.825.

Enclosed herewith is a diskette containing the Sequence Listing in this application in computer readable form (CRF) and a paper copy of the Sequence Listing in compliance with 37 C.F.R. § 1.821-1.825. Applicants hereby certify that the information in the computer readable form on the diskette and in the hard copy of the Sequence Listing is the same and includes no new matter. The enclosed computer readable copy and paper copy of the Sequence Listing are believed to bring the Sequence Listing into full compliance with the sequence rules, thus overcoming this objection.

III. Rejections under 35 U.S.C. § 112, second paragraph

The Office Action states that claims 57-67 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Specifically, the Office Action states that claim 57 is vague and indefinite because it is allegedly unclear as to what the term "comprising" entails.

Claim 57 is amended herein to recite a composition containing a T4 surface lattice protein array and a chimera, "wherein the chimera comprises" a molecule of interest, a T4 dispensable polypeptide and a linker, wherein the linker links the molecule of interest to the T4 dispensable polypeptide and wherein said chimera is bound to the T4 surface lattice protein array. Therefore, in claim 57, as amended, it is clear that it is the chimera that is defined by the elements listed after the term "comprising" in the claims as filed, namely, the molecule of interest, the T4 dispensable polypeptide and the linker. As amended, claim 57 clearly refers to a composition containing both the T4 surface lattice protein and a chimera. Thus, applicants believe this rejection has been overcome and respectfully request its withdrawal.

B. The Office Action further states that claim 63 is allegedly ambiguous in utilizing the phrase "encodes a dispensable polypeptide." The recited claim is allegedly unclear because it is not known if the composition contains more than one dispensable polypeptide.

Claim 63 is amended herein to recite the composition of claim 57, wherein the dispensable polypeptide is derived from a member of the T4 virus family. Therefore, as amended herein, it is clear that the dispensable polypeptide of this invention can be the T4 dispensable polypeptide or other dispensable polypeptides from the T4 virus family.

IV. Rejection Under 35 U.S.C. § 102(a)

Claims 57-67 are rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Ren et al. (Protein Science (1996), Vol. 5, pages 1833-1843). According to the Office Action, Ren et al. teach compositions in which molecules of interest are displayed through polymer binding. The polymers are T4 capsids and polyheads and the display molecules are derivatives of the dispensable capsid protein SOC.

Applicants note that the present application was filed on April 11, 1997, which is less than one year before the September publication date of Ren *et al.* and that the cited reference is the inventors' own publication. This reference lists co-authors not listed as co-inventors and is properly cited. Applicants are in the process of investigating the facts of co-authorship and co-inventorship. Once the analysis of the facts is complete, applicants will file a Katz-type Declaration, amend inventorship or take other necessary action to finally resolve this issue.

V. Rejection Under 35 U.S.C. § 102(b)

Claims 57, 62, 63, 64, 66 and 67 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Macdonald et al. (Embo. Journal, 1984, Vol. 3, No. 12, pages 2863-2871)-ABSTRACT ONLY. According to the Office Action, MacDonald et al. disclose DNA sequence and transcriptional patterns in T4 phage (T4 surface lattice protein array). The T4 phage is taught to be a suitable lattice protein in the instant invention. The Office Action also states that in an area between 15 and 18 kb on the standard phage T4 map, the novel gene 69 is localized and that this 69 gene (molecule of interest) codes for two overlapping proteins that share a common C-terminal segment. The two proteins are expressed from different transcripts that are under different regulation. The smaller protein, gp69*, can be expressed from a *Escherichia coli*-like promoter, but the expression of the larger protein p69 is delayed. The gene (69) is bracketed by DNA adenine methylase (linker) and the late gene SOC (T4 dispensable polypeptide).

Applicants respectfully point out to the Examiner that the MacDonald et al. reference merely teaches the genetic location of three separate genes on the standard phage T4 genetic map. None of these genes, either alone or in the disclosed arrangement encodes a chimera, much less a chimera wherein the chimera comprises a molecule of interest, a T4 dispensable polypeptide and a linker, wherein the linker links the molecule of interest to the T4 dispensable polypeptide and

wherein said chimera is bound to the T4 surface lattice protein array. When gene 69, DNA adenine methylase, and SOC are expressed, these genes are expressed as three different transcripts and not as a chimera, i.e. one transcript encoding more than one protein. Furthermore, the products of these three transcripts could not interact to produce a chimera comprising a molecule of interest, a linker and a T4 dispensable polypeptide. Also, the Office Action states that gene 69 (molecule of interest) is bracketed by adenine methylase (linker) and SOC (T4 dispensable polypeptide). Therefore, even if these three genes were to be expressed as a chimera, the linker, as defined by the Office (i.e. adenine methlyase) could not link the molecule of interest with the dispensable polypeptide as recited in the claims. Thus, MacDonald et al. do not teach or suggest any composition as claimed in the present invention. For these reasons, applicants believe the present rejection has been overcome and its withdrawal is respectfully requested.

VI. Rejections Under 35 U.S.C. § 103(a)

Claims 58, 59, 60, 61 and 65 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over MacDonald et al. in view of U. Aebi et. al. (*J. Mol. Biol.*, 1977, 110, pages 687-698) and Ladner et al. (U.S. Patent No. 5,403,484). According to the Office Action, MacDonald et al. differ from the instant invention in failing to teach the dispensable polypeptide-HOC and the different types of molecules of interest that may be expressed in this system (antigen, enzyme or immunoglobulin). Furthermore, the Office Action states that U. Aebi et al. disclose that the T4 phage has two dispensable capsids, namely, soc and hoc. Ladner et al. allegedly show that viruses expressing chimeric binding proteins can be useful in producing novel enzymes and hormones.

The Office Action further states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the HOC as a dispensable polypeptide and

express antigens, enzymes, or immunoglobulins as specific molecules of interest as taught by U. Aebi et al. and Ladner et al. in the method of MacDonald et al. to perform outer capsid phage display, because such dispensable polypeptides and molecules of interest as taught by U. Aebi et al. and Ladner et al. are well known in the art. Furthermore, the Office Action alleges that one having ordinary skill in the art would have been motivated to do this because Ladner et al. taught that the expressed protein binding characteristics could be determined by controlled genetic variations, which are able to select mutated genes with specific novel proteins having desirable binding properties.

Applicants respectfully point out to the Examiner, that, as stated above, MacDonald et al. disclose the genetic location of three genes on the T4 phage genetic map. There is no method disclosed, much less a method for performing outer capsid phage display as described in the present invention. Furthermore, applicants reiterate that MacDonald et al. does not teach or suggest any composition of the present invention.

With respect to Ladner et al., this reference describes a method of filamentous phage display in which a molecule of interest is displayed directly on the surface of the phage. The molecule of interest is fused with a coat protein, such as M13, which must pass through the secretion system of the phage in order to be displayed on the surface. Therefore, the molecule of interest is fused directly to a coat protein, not linked by a linker to a dispensable polypeptide that then binds a surface lattice protein. If anything, the teachings of Ladner et al. would motivate one of skill in the art to fuse a molecule of interest with a coat protein, not with a dispensable polypeptide that would then bind to a surface lattice protein. Furthermore, one skilled in the art would not be motivated to combine the teachings of this reference with the teachings of Aebi et al. because even with the knowledge of the existence of dispensable capsids, there is no suggestion in Aebi et al. that these dispensable polypeptides can be linked to molecules of interest to make chimeras that would then bind to surface lattice proteins. In fact, Aebi et al.

state on page 697, that the function of hoc and soc proteins are unknown. One skilled in the art would know that hoc and soc are dispensable because Aebi et al. teach that they are not necessary for the assembly of phage and the dispensable polypeptides can be bound to phage lacking dispensable polypeptides. This does not provide a reasonable expectation that a dispensable polypeptide can be linked by a linker to another molecule and still retain the ability to bind to intact phage. Therefore, there is no teaching or suggestion in MacDonald et al., Ladner et al. or Aebi et al., alone or in combination that would allow one of skill in the art to arrive at the claimed invention. Thus, applicants respectfully request withdrawal of this rejection.

Pursuant to the above amendments and remarks, reconsideration and allowance of the pending application is believed to be warranted. The Examiner is invited and encouraged to directly contact the undersigned if such contact may enhance the efficient prosecution of this application to issue.

A check in the amount of $890.00 and a Request for Extension of Time are enclosed. This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231, on the date shown below.

Gwendolyn D. Spratt — 3-26-01

Gwendolyn D. Spratt — Date